

(Claims)

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1. A film-forming method of supplying gaseous molecules, each composed of plural atoms, onto a substrate, wherein the plasma composed of the mixed gas of an inert gas and the gas containing the gaseous molecules is generated to excite the inert gaseous molecules, and the excited inert gaseous molecules having higher quasi-stable level energies than the ones requiring to dissociate the gaseous molecules into their atomicity elements are collided with the gaseous molecules to dissociate them into their atomicity gaseous elements to supply the elements onto the substrate.

2. A film-forming method as defined in claim 1, wherein the gaseous molecules are oxygen molecules.

3. A film-forming method as defined in claim 1, wherein the gaseous molecules are nitrogen molecules.

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4. A film-forming method as defined in ~~any one of claims 1 to 3~~, wherein the inert gaseous has a molecule density not less than that of the gaseous molecules in the mixed gas.

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5. A film-forming method as defined in ~~any one of claims 1 to 4~~, wherein the substrate is a silicon substrate and the gaseous molecules contains the constituting elements of a silicon compound to be film-formed onto the substrate.

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6. A film-forming method as defined in claim 5, wherein at least a part of the silicon elements constituting the silicon compound are dissociated into the atomicity silicon elements.

7. A film-forming method as defined in claim 5, wherein the silicon compound is a silicon oxide.

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8. A film-forming method as defined in claim 7, wherein the inert gas is krypton gas and the gaseous molecules are oxygen molecules to be dissociated into the atomicity oxygen element to oxidize the substrate.

9. A film-forming method as defined in claim 7, wherein the inert gas is xenon gas and the gaseous molecules are oxygen molecules to be dissociated into the atomicity oxygen elements to oxidize the substrate.

10. A film-forming method as defined in claim 5, wherein the silicon compound is a silicon nitride and the inert gas is helium gas, and the gaseous molecules are nitrogen molecules to be dissociated into the atomicity nitrogen elements to nitride the substrate.

11. A film-forming method as defined in claim 5, wherein the silicon compound is a silicon oxynitride.

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